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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/836,794	04/17/2001	Jeffrey Stewart	STEW-015A	6777

7590

10/01/2002

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EXAMINER

SAGAR, KRIPA

ART UNIT

PAPER NUMBER

1756

DATE MAILED: 10/01/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/836,794

Applicant(s)

STEWART, JEFFREY

Examiner

Kripa Sagar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 12 recite the limitation "exposing the treated second surface..." in step (h) followed by "exposing the metal substrate to a suitable solution" in step (i). In the art, the step of exposing the photoresist is followed by development of the exposed resist in a suitable developer to expose the underlying substrate. The term "exposing the metal substrate" implies that the resist has been developed. This is ambiguous and confusing.

Claims 3 and 14 recite the term "the metal substrate is brass copper". The term "brass copper" is not defined in the specification. Brass is an alloy of copper.

Claims 6 and 17 recite the limitation "the maskant is liquid film". The nature of the mask is vague and confusing. Resists are conventionally coated from a liquid or laminated as a dry film. The mask itself is dried after coating or lamination.

Claims 2-11 and 13-22 depend from claims 1 and 12.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat.6345502 to Tai et al in view of US Pat. 5618379 to Armacost et al. and further in view of US Pat 6033582 to Lee et al.

The application discloses a method of forming a thin supported film. The membrane-forming film is coated on one surface of a supporting substrate. A photoresist is coated on the opposite surface and patterned. The exposed areas of the substrate are etched through to form a perforated support for the membrane.

The claims recite the steps for forming the membrane, the materials of the substrate, the masks and the membrane.

Tai teaches a method of forming a parylene membrane on a Si substrate (Fig.1A-F). The steps include parylene deposition on *both* surfaces of the substrate and etching the silicon substrate. Conventional photolithographic methods are used for patterning the silicon. The areas to be protected during the etch, are masked by the photoresist (2;7-12). Tai teaches processing the Si substrate in vacuum, masking, liquid etching (with KOH), plasma etching, photolithographic patterning and etching a window in the substrate to form a supported membrane.

Tai does not teach masking for *deposition* of a coating, or plasma etching to promote coating adhesion to a surface.

Lee teaches the modification of the surface of a substrate prior to coating. In one embodiment stainless steel and other metals are plasma etched (11;35-12;5) to roughen the surface and promote adhesion of a polymer coating (14;10-40). The polymer coatings may be formed by plasma arc and vapor deposition processes (15;5-9).

Lee teaches that it is conventional to use static masks to protect the areas that are not to be etched (3;5-9). However it does not teach masking to prevent deposition of materials.

Armacost teaches the art of selectively masking a substrate to limit deposition of coatings from the vapor phase. In the vapor phase deposition of parylene it is well known to mask off protected areas. Masking tapes and soluble hydrocarbon films (beeswax) are routinely used as maskants. Following the coating operation the masks are removed (1; 11-37). Armacost discloses patterning a mask on a Si substrate and depositing parylene in the unmasked areas. The patterned mask may be formed by a shadow mask or a lithographic process using a photoresist (2;43-3;49).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to roughen the surfaces of substrates using a plasma etch, prior to coating a polymer film as taught by Lee and masking the protected areas of the substrate against deposition as taught by Armacost while forming the parylene membrane on a Si support as taught by Tai because Lee teaches that the plasma etch

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produces distinctive surface morphologies which promote reliable and functional adhesion of materials to surfaces (4;1-12) while Armacost teaches that deposit masking is conventional but in parylene coating the novel mask facilitates removal of the coating from undesired locations(1;38-44).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Pat. 6086773 to Dufresne et al. teaches a method of coating a resist on a metal substrate, patterning it and etching it in a liquid followed by *neutralizing* the substrate (17; 15-16). The substrate is perforated and the resist may be modified, to permanently coat the substrate. These are standard and well-known operations.

The non-patent publication of Licari and Hughes (Handbook of Polymer Coatings for Electronics, eds: J.J. Licari and L.A.Hughes, Noyes, 2nd edition (1990), (p 73-84, and p.150-195) teaches the use of parylene coatings in semiconductor applications (p.80-83). The method of coating from the monomers in the vapor phase is discussed (p.74-76). The cleaning of the substrate prior to coating by plasma etching is taught (p.159-161).

6. The processes of coating, etching and forming membranes have been in practice for a long time. The Applicant's claims to a process and a product are very broad, conventional and well known in the in the semiconductor and bio-medical arts. They are anticipated by the cited references.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kripa Sagar whose telephone number is 703-605-4427. The examiner can normally be reached on 8:00AM--5:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

MH/ks
September 25, 2002



MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700